“Potential intermodal transport between the EU-15 and the CEECs ”

NEA Transportonderzoek- en opleiding

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Bijdrage aan het Colloquium Vervoersplanologisch Speurwerk 2004,

25 en 26 november 2004, Zeist

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Samenvatting

Potentieel intermodaal vervoer tussen de EU-15 en de Centraal en Oost-Europese landen

Het paper beschrijft een methode voor de bepaling van potentieel toekomstig intermodaal vervoer in 2015 gevolgd door een overzicht van dit potentieel intermodaal vervoer voor twee scenario's; een referentie scenario en een alternatief scenario. In de toegepaste methode wordt potentieel toekomstig intermodaal vervoer bepaald op basis van kenmerken van het totale toekomstige vervoer (gebaseerd op een prognose). Het totale toekomstige vervoer wordt beschouwd als een reservoir van conventioneel vervoer en intermodaal vervoer. Om te bepalen welk deel van dit reservoir in potentie intermodaal vervoer kan zijn worden een aantal criteria gehanteerd zoals: transport afstand, vervoerd volume, goederensoort en marktaandelen. De goederenstromen die aan de criteria voldoen worden gekenmerkt als potentieel intermodaal vervoer. Het potentieel intermodaal vervoer dat zodanig bepaald is geeft een goede indicatie op welke relaties ontwikkelingen in intermodaal verwacht kunnen worden in de toekomst. Het werkelijke volume intermodaal vervoer in 2015 is echter niet alleen afhankelijk van een aantal technische criteria, maar vooral ook van beslissingen van verschillende marktpartijen, overheden en EU beleid.

Summary

Potential intermodal transport between the EU-15 and the CEECs

This paper describes the methodology for determining the potential future intermodal transport demand in 2015 followed by an overview of the potential future intermodal transport demand for a reference scenario and an alternative scenario. The applied approach determines the potential future intermodal transport flows based on characteristics of a forecast of the total future transport demand. The forecast of the total transport demand is considered as a reservoir of conventional and intermodal transport flows. In order to determine what part of this reservoir belongs to the future intermodal transport demand a number of criteria like transport distance, transport volume, commodity types and intermodal market shares are applied on the total forecasted future transport flows. The flows fulfilling the different thresholds of the criteria are being indicated as future potential intermodal transport. The overview of the future potential intermodal transport demand is a good indication of where developments of intermodal transport can be expected in the future. How large the actual intermodal transport demand in 2015 finally will be depends not only on technical conditions related to transport flows but also to a large extent on the decisions taken by actors in the market, local governments, EU policy and the interaction between them.

1 INTRODUCTION

1.1 OBJECTIVES OF THE INTERMODA PROJECT

INTERMODA is an EC-supported project within the Fifth Framework Programme that has several stated objectives. The project will specify a Pan-European intermodal transport network. It will record, analyse and assess the current situation in Pan-European intermodal transport and forecast the future demand for this type of transport. From this analysis, the aim is to identify bottlenecks and define measures to improve and align the current and future network in order to eliminate or mitigate the bottlenecks. The final goal of the project is to estimate the feasibility and impact of these measures for an (improved) intermodal network between the EU-15 countries and the CEECs.

One objective of the Common Transport Policy (CTP) of the European Commission (EC) is to strengthen the position of intermodal transport in order to make it competitive with road transport. It should contribute to the integration of different modes so as to enable an efficient and cost-effective use of the transport system. This has led to the promotion of intermodal transport by the Commission for years in order to remove the obstacles currently hindering the further development and use of this mode. Research has been one of the most important actions to achieve these objectives.

The aim of this paper is to identify origin and destination relations that have potential for intermodal transport within and in relation with the CEECs. More information about INTERMODA can be found on the Intermoda website: www.intermoda.org.

1.2 STRUCTURE OF THE PAPER

This paper contains five chapters, as specified in the table of contents. This introduction chapter describes the background and objectives of the INTERMODA project and gives an overview of the structure of the paper.

Chapter 2 describes the scenarios on which the forecasts of the future transport demand are based. The chapter starts with the use of relevant base year information. Following, the reference and the alternative scenario that are applied in the INTERMODA project are described.

Chapter 3 deals with the forecasting of the future transport demand. A general overview of the forecasting process is given that shows the sequence of applied models. In the rest of this chapter the intermodal model is described in detail.

Running the models with the scenario input produces forecasts for the future transport demand. Chapter 4 gives an overview of the future transport demand, both for the total future transport demand as for the future potential intermodal transport demand. Results and an analysis of these results are given for the reference scenario and for the alternative scenario. In chapter 5 the approach is summarized and the main conclusions are given.

2 SCENARIOS

2.1 INTRODUCTION

This chapter describes the applied scenarios. In the first section the use of base year information. Finally the reference and the alternative scenarios that are applied in the INTERMODA project are elaborated in detail.

2.2 BASE YEAR INFORMATION

Base year information is an important starting point for making forecasts. If good and reliable information is available for the base year, changes resulting from developments in the forecasting period that are described in a scenario can be applied to the base year in order to calculate the results for the forecast year. Such models are called growth models1. Growth models have the advantage that they have a solid fundament in the base year O/D matrix. If no information is available for the base year, growth models can not be applied. In such cases synthetical models have to be applied.

Total transport flows

To gather as much as possible relevant data for the year 2000 from all CEECs a data request has been sent to these countries. From some countries high quality data has been received while for other countries no data at all or unreliable data has been received. The data gaps for countries not delivering reliable data have been filled with data from the NEAC2 database. This procedure of combining recent data from the CEECs with updated information from NEAC resulted in a consistent database for the year 2000 covering all transport modes and all commodities. In this database the regions in the CEECs and in Western Europe3 are on NUTS 2 level. This database contains no information about intermodal flows in the base year.

For the total transport flows high quality base year information is available. As a consequence a scenario describing the changes in the forecast period is sufficient to produce the forecast. For the forecast of the total transport flows a growth model will be used that applies the expected growth in the forecast period on the base year values to calculate the forecast values.

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[1] Growth can be either positive or negative.

[2] The NEAC system is a system that describes inter-regional freight transport chains in Western and Eastern Europe by regions, by modes and by commodities for the current situation and for future years. This system has been privately developed by NEA and it is property of NEA. More information about the NEAC system can be found on the NEAC website: www.nea.nl/neac.

Intermodal transport flows

For the determination of the future intermodal transport demand the intermodal flows are defined as the transport of standard loading units (containers, swap body, semi-trailer, ...) according to the definition of EUROSTAT and ECMT which is as follows: "Intermodal transport is the movement of goods (in one and the same loading unit or vehicle) by successive modes of transport without handling of the goods themselves when changing modes".

Ideally base year information will be used to make forecasts. Unfortunately, it is not possible to find statistics fulfilling these requirements, especially for intermodal transport flows within and in relation with the CEECs. Neither national statistics nor EUROSTAT have systematically gathered these data.

It has been decided not to use the available intermodal base year information in the forecasting process, because of reasons that are summarized as follows:

- The intermodal flows within and in relation with the CEECs are low and concentrated on a limited number of relations;
- Intermodal statistics are not accurate and not complete (especially not for the CEECs);
- For the RoLa flows it is expected that the volumes will decrease in the future when border crossing problems are solved due to the EU enlargement, therefore these flows are no good starting point to base the forecasts on;
- The intermodal flows between Western Europe and the CEECs fluctuate too much for using them as a starting point for a forecast.

As a consequence of this the scenario part dealing with intermodal transport should not only describe changes in the forecast period but provide a description of a possible future that could be used to make a forecast of the future intermodal transport flows without knowing the current intermodal transport flows.

2.3 SCENARIOS USED IN INTERMODA: REFERENCE AND ALTERNATIVE SCENARIO

It has been decided to apply two scenarios: a reference scenario and an alternative scenario. In the reference scenario it is assumed that the current and already foreseen growth patterns and

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[3] Western Europe consists of the EU-15 plus Norway and Switzerland.

exogenous developments will take place. A scenario is a description of a possible future situation; the reference scenario can be regarded as the most likely possible future situation given the information we currently have.

Although it is attempted to develop a reference scenario that represents the “most likely future situation”, there are many future situations possible. In order to obtain a broader view on the range of possible outcomes an alternative scenario describing a different possible future situation based on different future developments has also been applied. These two scenarios produce different results for the future transport demand.

The alternative scenario that is applied assumes that the same developments take place as in the reference scenario with on top of that the assumption that the European integration process proceeds at a more rapid pace. Because of the more rapid European integration process it is assumed in the alternative scenario that also the intermodal transport related to the CEECs will develop more rapidly.

Both the reference and the alternative scenario consist of a number of sub-scenarios dealing with specific future developments. Three sub-scenarios are distinguished:

- An economic sub-scenario describing the general economic situation by region
- A transport sub-scenario describing structural changes in the transport market, infrastructure changes and policy measures
- An intermodal sub-scenario describing specific intermodal developments

The economic sub-scenario will be used to forecast the total future trade flows by commodity between regions; the transport sub-scenario will be used to forecast the share of each transport mode (modal-split) in these total future transport flows. The intermodal sub-scenario will be used to forecast the volumes of the intermodal transport flows.

The alternative scenario is used as a scenario for sensitivity analysis. The expectation is that the outcomes in the alternative scenario will only differ slightly from the outcomes from the references scenario.

3 FORECASTING FUTURE TRANSPORT DEMAND

3.1 INTRODUCTION

This chapter describes the models that are used to make forecasts for the total future transport demand and for the future potential intermodal transport demand.

In the next section a general overview of the forecasting process is given.

3.2 GENERAL OVERVIEW OF THE FORECASTING PROCESS

The modelling process is a sequential process, starting with the trade model.

This model requires as input the O/D matrix for the base year 2000 and the quantified scenario results from the economic sub-scenario. The trade model produces forecasts of trade flows for the year 2015 by O/D, by commodity and by mode, but with an unchanged modal-split (modal-split is still the same as the modal-split for the base year).

The modal-split model actually consists of two sub-models: an analogy model and a conventional modal-split model. First the analogy model is applied. The analogy model uses as input the output from the trade model and the quantified scenario results from the transport sub-scenario part dealing with structural changes in transport markets. In the analogy model the modal-split in the CEECs converges to the modal-split in the Western European situation due to the restructuring of the transport markets. On top of the modal-split changes resulting from the analogy model, the conventional modal-split model uses the quantified scenario results from the transport sub-scenario part dealing with infrastructure and policies to estimate modal-split changes resulting from changes in transport costs and transport times. The modal-split model produces forecasts of trade flows for the year 2015 by O/D, by commodity and by mode with a new estimated modal-split for the future situation.

The combination of the trade model and the modal-split model produce the total future transport demand. This total future transport demand, together with the quantified scenario results from the intermodal sub-scenario, is used by the intermodal model to forecast the potential intermodal transport demand.

The sequence of model runs is applied twice, once for the reference scenario with the accompanying scenario input and once for the alternative scenario with the accompanying scenario input.

In the next section the intermodal model is presented.

3.3 THE INTERMODAL MODEL

The purpose of the intermodal model is to make an estimate of the future intermodal transport demand within and in relation with the CEECs. Different methods have been applied for maritime and non-maritime transport flows4. Both methods are described for both scenarios.

The intermodal model determines the future potential intermodal flows by applying criteria on the future total transport flows. Specific thresholds for the criteria commodity type, transport distance, transport volume and market share are applied given specific assumptions in the reference scenario and the alternative scenario.

In general, the relation between the mentioned criteria and intermodal transport is as follows:

- Commodity types: intermodal transport appears to have a higher share in e.g. foodstuffs, chemical products and general cargo;
- Transport distance: the potential of intermodal transport lies primarily in long-distance relations. For short distance transport the transhipment and pre and end haulage activities at terminals make intermodal transport less competitive compared with road transport, for longer transport distances these activities have (relative) less influence on transport times and tariffs;
- Transport volume: to ensure profitability a minimum level of transport volume is needed. The volume must guarantee a sufficient occupation rate of the transport unit (train, barge or vessel) in order to cover the high share of fixed costs and to make several departures per week possible;
- Market share: dependent on the conditions for intermodal transport the market shares of intermodal transport in Western Europe differ between O/D relations. Under normal conditions the market share is relatively low, under better conditions for intermodal transport the market share is higher.

[4] Maritime flows are flows for which at least a part of the journey is transported over sea, this can be both short sea shipping between region in Europe or intercontinental transport. Non-maritime flows are flows for which no part of the journey is transported over sea, basically these flows are continental flows.

The intermodal model for the maritime flows uses information about the current situation in Western Europe and applies this information on the transport flows in the CEECs in order to determine the potential intermodal flows.

The methods for the non-maritime flows and the maritime flows are described for the reference and for the alternative scenario.

Reference scenario, non-maritime flows

The non-maritime or continental potential intermodal flows mainly concern (road-rail) combined transport flows. In a combined transport chain standard loading units are first transported from the origin to a road-rail terminal by road, to another road-rail terminal by rail and then to the destination by road again. In most cases the largest part of the journey is transported by rail and the pre and end haulage is transported by road. As stated before, these kind of intermodal flows related to the CEECs in the base year are very limited and the available statistics are neither accurate nor complete. To determine the future potential intermodal transport flows related to the CEECs, the assumption is made that the same criteria as they are used to determine the current intermodal potential in Western Europe can be applied on the future Eastern European situation.

As a result from the trade model and the modal-split model the total future transport flows within and in relation with the CEECs are available, but no information about future intermodal flows is available. In order to determine the future potential intermodal transport flows, it has to be determined what kind of transport flows and what part of these transport flows out of the total future transport flows could be future intermodal transport flows. The following criteria will be used for this:

1. The target market of intermodal transport is the road transport market. If an increase in intermodal transport is aimed at, this should be achieved by shifting road transport to intermodal transport. It is assumed that in theory all road transport (all commodity types) could be shifted to intermodal transport. From the rail transport in the base year by approximation everything is conventional rail transport (intermodal transport in the base year is very limited). It is assumed that when intermodal transport will get more competitive in the future, from the non-bulk[5] conventional rail transport 20% can shift

[5] In this method non-bulk products are defined as: agricultural products, foodstuffs, metal products, fertilisers, chemicals, machinery & other materials, petroleum products.

to intermodal transport. In this first step, all road transport and 20% from the conventional non-bulk rail transport flows is potential intermodal transport.

2. Continental intermodal transport is considered to be only competitive for transport distances above 400 kilometres, because for transport distances lower than 400 kilometres the share of the terminal related activities in the transport costs and transport times is relatively high. In this second step the potential intermodal transport is equal to the potential intermodal transport in the first step, but with the restriction that the transport distance is higher than 400 kilometres.

3. The market share of continental intermodal transport flows depends on the competitive position of intermodal transport compared to road, i.e. the quality and the costs of the services. Normal market shares of intermodal transport in Western Europe are around 20%. When the conditions for intermodal transport are better the market share of intermodal transport gets higher. In this respect, the market share should be interpreted as the maximum share of the transport market that is performed by intermodal transport. Given the restrictions under step 1 and step 2 the market conditions can be at least regarded as 'normal' meaning that the maximum market share is at least equal to 20%. The transport distance and the total transport volume are taken as proxy for the conditions for intermodal transport on an O/D relation. Dependent on combinations of higher transport distances and higher total transport volumes the maximum market share of intermodal transport gets higher. In the third step the potential intermodal transport is equal to the potential intermodal transport in the second step, but with the restriction of the defined maximum market shares of intermodal transport.

4. A minimum level of transport volume must guarantee a sufficient occupation rate of the transport service in order to cover the high share of fixed costs and to make several departures per week possible. This minimum level depends on the type of service that is offered. A daily shuttle service requires a very high transport demand generated in the region where the terminals are located. For operating systems in which flows are clustered (hub and spoke or gateway systems, often with lower frequencies), the minimum values are lower. Regarding the minimum required transport volume, a number of assumptions are made. For relative short intermodal transport distances –

400 to 600 kilometres – at least 200.000 tonnes is required for a shuttle service. Other types of services are not relevant on this short distance, because these are less competitive. For medium intermodal transport distances – 600 to 1000 kilometres – this threshold is lowered to 50.000 tonnes and for long intermodal distances – more than 1000 kilometres – the threshold is even lowered to 20.000 tonnes. The theory behind this is that with longer distances the additional costs and time consumption caused by combining different O/D flows will be offset by advantages on the rail leg. In this fourth step the potential intermodal transport is equal to the potential intermodal transport in the third step, but with the restriction that the intermodal transport volume on O/D level is higher than the thresholds by distance class.

Applying these four steps on the total future transport flows in the reference scenario the future potential intermodal transport results.

This method has been tested on the Western European situation and compared with available statistics for Western Europe. The conclusion can be drawn that this method produces results for the Western European situation that are - on an aggregate level - close to the 'actual situation' described in the statistics.

Reference scenario, maritime flows

The maritime flows consist of short sea shipping flows with both origin and destination within European countries and of intercontinental flows to seaports where cargo is transhipped from or into intermodal services. For these flows a different method has been used. For the EU countries a maritime statistic6 is available at EUROSTAT describing all maritime transport flows between countries/main coastal areas by cargo type for the year 2000. The cargo type variable distinguishes amongst others container and ro-ro transport. By using this information the share of container and ro-ro transport in the total maritime transport flows is calculated on a country to country level for all maritime transport related to the EU countries. In the applied method the container and ro-ro transport flows are considered as intermodal maritime transport flows.

[6] Annual seaborne transport between reporting countries/MCA (Main Coastal Area) and partner countries/MCA, by direction, type of cargo and nationality of vessel (in 1000 tonnes), year 2000, New Cronos, Eurostat

The main assumption is that the share of intermodal maritime transport flows in the total maritime transport flows in the CEECs will converge to the current situation in Western Europe. Therefore, the intermodal shares from the maritime EUROSTAT statistic are applied on the total future maritime transport flows from the reference scenario. For the bulk commodities the maritime intermodal transport flows are assumed to be zero, for the non-bulk commodities metal products, chemicals and petroleum products the Western European shares are partly applied and for the non-bulk commodities agricultural products, foodstuffs, chemicals and machinery & other manufacturing the Western European share are fully applied.

Because the potential intermodal transport demand for maritime flows are determined based on the trade relation in the O/D matrix, not only the potential intermodal transport for the sea transport part is estimated, but also for the corresponding hinterland transport part.

As extra restrictions the hinterland transport (by road, rail or inland waterways) of potential maritime intermodal transport should have a distance of more than 200 kilometres and have a transport volume of more than 50.000 tonnes.

Alternative scenario, non-maritime flows

For the forecast of the potential non-maritime flows in the alternative scenario, the total future transport flows from the alternative scenario, are taken as a starting point. The same method has been applied as for the reference scenario. Besides, some of the thresholds for the criteria have been changed. For each of the four steps is indicated whether the method has changed and what these changes are: the first, second and fourth step in the alternative scenario are identical to these steps in the reference scenario. In the third step the maximum intermodal market shares have been changed slightly. The assumption in the alternative scenario is that the future intermodal transport market will converge more rapidly to the current intermodal transport market in the EU. As a result of this the maximum intermodal market shares will be higher in the alternative scenario due to the fact that the intermodal transport market is further developed in the alternative scenario, especially on the medium and long distance relations.

Alternative scenario, maritime flows

For the forecast of the maritime flows in the alternative scenario, the same method has been applied as for the reference scenario. The intermodal shares from the EUROSTAT statistic are applied on the total future maritime transport flows from the alternative scenario and on top of

that the intermodal market shares are slightly raised representing the more rapid convergence. On average the intermodal market shares in the alternative scenario are about 5% higher compared with the intermodal market shares in the reference scenario.

The results of the sequence of model runs for both the reference and the alternative scenario are presented in chapter 4 “Overview of future transport demand”.

4 OVERVIEW OF FUTURE TRANSPORT DEMAND

4.1 INTRODUCTION

This chapter presents the forecasts of the total future transport flows and the future potential intermodal transport flows within and in relation with the CEECs.

The description of the forecasting results starts with a brief overview of the total future transport flows in 2015 for the reference scenario and the alternative scenario. This is followed by an overview of the future potential intermodal transport flows in 2015 for both scenarios.

4.2 FUTURE TRANSPORT DEMAND IN THE REFERENCE AND THE ALTERNATIVE SCENARIO

The forecast of the total future transport demand is necessary for the determination of the potential intermodal transport flows. Major developments on growth in domestic transport, total export and total import for each of the CEECs in the period between 2000 and 2015 for both scenarios are presented in Table 4-1.

Table 4-1 *Growth domestic transport, total export and total import in the reference and the alternative scenario (index 2000 = 100)*

Future Transport Demand	Domestic Transport	Total Export	Total Import
reference scenario (index)	145,2	177,6	190,6
alternative scenario (index)	155,1	190,4	203,7
alternative vs. reference scenario (%)	6,8%	7,2%	6,9%

In the reference scenario domestic transport has a relative low growth with 45.2%, total export and total import show a more rapid growth, respectively 77.6% and 90.6%. In the alternative scenario domestic transport grows with 55.1% compared with 45.2% in the reference scenario, domestic transport is 6.8% higher in the alternative scenario. The export in the alternative scenario grows with 90.4% instead of 77.6% in the reference scenario; this means an increase of 7.2% compared with the reference scenario. The growth of the import in the alternative scenario is 103.7% instead of 90.6%, total import is 6.9% higher in the alternative scenario.

In Table 4-2 the market share of the modal-split of total export and total import of the CEECs in the reference and the alternative scenario are shown. Only the most important modes: road and rail are presented; the changes in the other modes are rather limited. The first part of the table consists of the total import and export flows of the CEECs, the second part presents the total export and import within the CEECs and the last part shows the total export and import in relation with Western Europe.

Table 4-2 *Market share of the modal-split total export and total import in the reference scenario and the alternative scenario*

Total export and total import of the CEECs				
	Export		**Import**	
Modal split	**road**	**rail**	**road**	**rail**
base year	29,7%	46,4%	23,1%	40,7%
reference scenario	36,3%	38,5%	35,9%	31,1%
alternative scenario	39,0%	36,2%	38,7%	28,3%
Total export and total import within the CEECs				
	Export		**Import**	
Modal split	**road**	**rail**	**road**	**rail**
base year	22,2%	66,7%	25,4%	61,5%
reference scenario	31,6%	57,2%	35,3%	51,5%
alternative scenario	35,3%	53,8%	39,1%	48,0%
Total export and total import of the CEECs in relation with Western Europe				
	Export		**Import**	
Modal split	**road**	**rail**	**road**	**rail**
base year	37,1%	40,0%	58,1%	21,4%
reference scenario	45,1%	30,1%	63,0%	16,9%
alternative scenario	47,5%	27,7%	64,5%	15,3%

In the reference scenario the developments in the market share of the modal split for all parts of this table are as follows. For both export and import road transport increases while rail transport decreases. At present rail transport has a high share in the transport within the CEECs, but in future this share will decrease. The increase of the road share and the decrease of the rail share are to a large extent caused by the structural change of the transport market in Eastern Europe. In the alternative scenario the increase of the road share and the decrease of the rail share are slightly higher.

4.3 FUTURE POTENTIAL INTERMODAL TRANSPORT DEMAND 2015 - REFERENCE SCENARIO AND ALTERNATIVE SCENARIO

This section describes the potential intermodal transport demand in 2015 in the alternative scenario and in the reference scenario. Table 4-3 shows the total future potential intermodal transport in the reference and alternative scenario for non-maritime and maritime flows.

Table 4-3 *Total future potential intermodal transport in 2015 in the reference and the alternative scenario in millions of tonnes*

TRANSPORT FLOW		reference scenario	alternative scenario	% change
Continental	within CEECs	13	18	38%
	between CEECs and Western Europe	17	24	41%
Maritime	intercontinental	16	19	19%
	continental	20	26	30%
Total		**66**	**87**	**32%**

The total future potential intermodal transport demand in 2015 is forecasted to be about 66 million tonnes in the reference scenario, it concerns intermodal transport flows entering, leaving or going through the CEECs. In the alternative scenario the total future potential intermodal transport is forecasted to be about 87 million tonnes, 32% higher than the reference scenario. In the applied intermodal model and also in the presentation of the results, a distinction is made between non-maritime flows and maritime flows. The non-maritime flows can be considered as continental flows by inland modes (these flows will be called continental flows in the rest of this chapter). Maritime flows are transport flows with at least one part of the journey by sea.

Continental transport flows

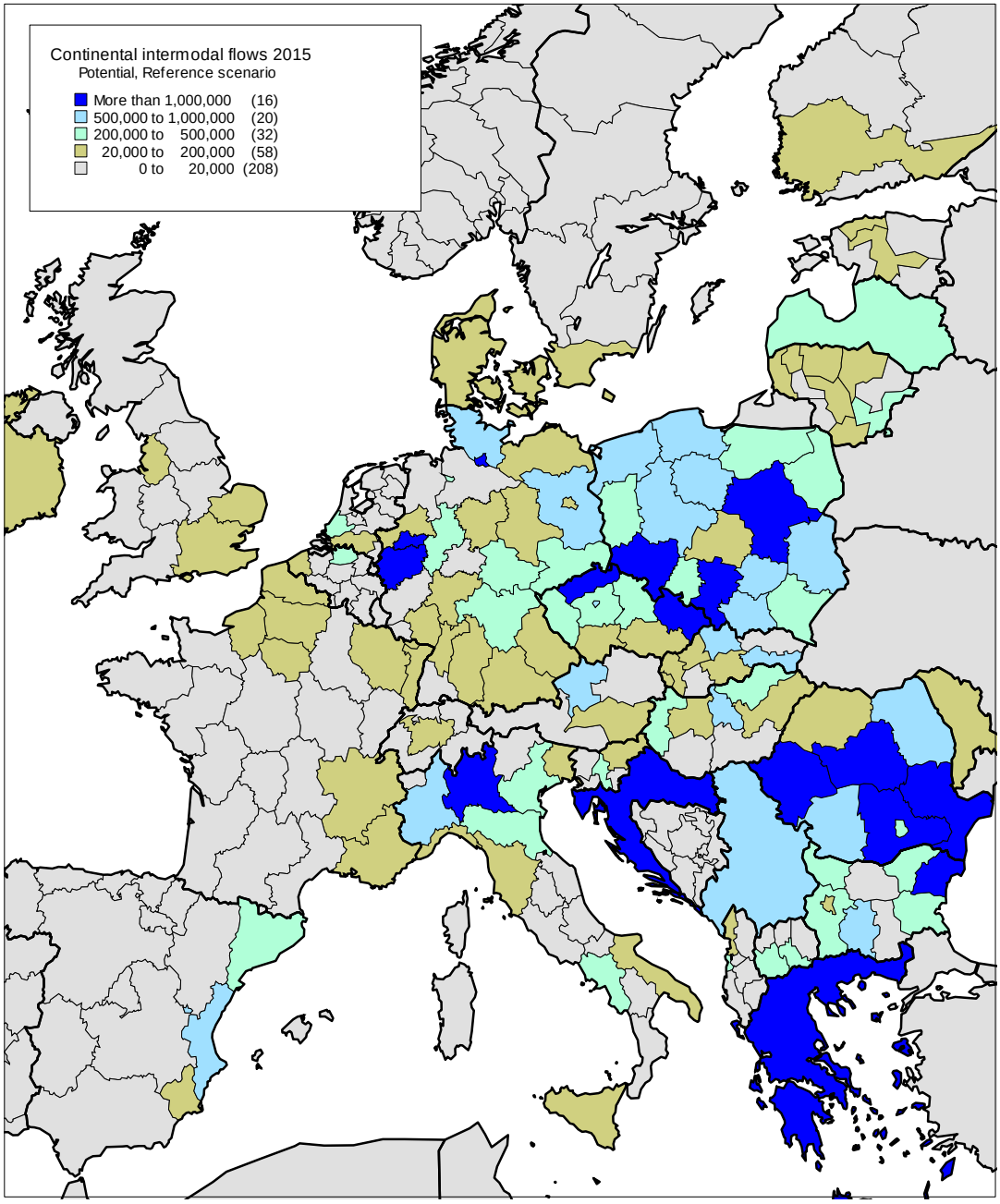
The potential intermodal transport demand related to continental flows in the reference scenario is about 30 million tonnes (13 within the CEECs and 17 between the CEECs and Western Europe). In the alternative scenario the potential intermodal transport demand is about 42 million tonnes (plus 40 %). From this 42 million tonnes, 18 million tonnes concerns potential intermodal transport within the CEECs and 24 million tonnes concerns potential intermodal transport between the CEECs and Western Europe.

The potential continental intermodal transport flows consist of combined road-rail transport flows. The main part of the journey of these flows is carried out by rail and the pre and end haulage is carried out by road. In the reference scenario about 80% of the continental

intermodal transport flows transported within the CEECs concerns domestic transport, this share is the same for the alternative scenario. The international transport flows within the CEECs fulfil the requirements for intermodal transport to a less extent than the domestic transport flows. Even in the alternative scenario, which is a more ‘optimistic’ scenario for intermodal transport the potential intermodal transport within the CEECs related to international transport flows is limited. This is caused by the fact that international transport within the CEECs is relative low compared with domestic transport within the CEECs. Although international transport within the CEECs almost doubles up to the forecast year 2015, it stays relative low compared with the situation in Western Europe.

Figure 4-1 gives a detailed overview of the continental intermodal transport in the reference scenario 2015. This figure gives an overview of the total continental potential intermodal transport flows arriving in and departing from each of the distinguished regions. The regions with the highest potential intermodal transport flows are highlighted in this figure.

Figure 4-1 *Overview of continental intermodal transport in 2015, reference scenario, total arriving and departing transport volumes by region (annual weight in tonnes)*



Maritime transport flows

The potential intermodal transport demand related to maritime flows in the reference scenario is about 36 million tonnes. From this 36 million tonnes of maritime flows, 16 million tonnes concerns intercontinental transport and 20 million tonnes concerns continental transport (short sea shipping between regions within Europe). For the alternative scenario: total maritime flows are 45 million tonnes, which consists of 19 million tonnes of intercontinental transport and 26 million tonnes of continental transport.

The potential intermodal transport flows being part of maritime flows are flows for which at least one part of the journey is transported by sea. This can be for instance an intercontinental transport flow from the USA over sea to Europe where it is transhipped in a port on one of the hinterland modes, or a continental transport flow from Spain over sea to a port where it is transhipped to one of the hinterland modes.

The intercontinental parts of the maritime chains are not very relevant within Intermoda, the hinterland flows being part of a maritime chain (continental or intercontinental transport) and the short sea flows (sea flows with both origin and destination in Europe) are the interesting parts for this project. These two flow types are described in more detail below.

Hinterland flows as part of a maritime chain

The potential hinterland transport flows being part of a maritime transport chain have a volume of 25 million tonnes of which 23 million tonnes is being transported within the CEECs and 2 million tonnes is transported between the CEECs and Western Europe. The total volume of 25 million tonnes of hinterland transport consists of both hinterland transport of intercontinental and continental transport chains. The difference of 11 million tonnes between the total maritime flows (36 million tonnes) and the hinterland flows (25 million tonnes), concerns maritime flows without hinterland transport (direct transport between ports).

Hinterland-flows mainly concern rail transport flows to and from seaports, a small part is inland waterways transport to and from seaports. For the alternative scenario: the potential hinterland transport flows being part of a maritime transport chain have a volume of 29 million tonnes of which 26 million tonnes is transported within the CEECs and 3 million tonnes is transported between the CEECs and Western Europe.

Short sea flows

The potential short sea transport flows being part of a maritime transport chain have a volume of 20 million tonnes of which 3 million tonnes is transported within the CEECs and 17 million tonnes is transported between the CEECs and Western Europe. For the alternative scenario: the potential short sea transport being part of a maritime chain has a volume of 26 million tonnes of which 4 million tonnes is transported within the CEECs and 22 million tonnes is transported between the CEECs and Western Europe.

For more detailed results see INTERMODA Deliverable D9: Future Transport Demand. Within the INTERMODA project NEA Transport Research and Training has also developed a tool for sensitivity analysis; this tool is used to estimate a broader range of scenarios.

5 CONCLUSION

In this chapter main conclusions are given regarding the applied methodology and the forecast of future intermodal transport demand. Before forecasts were produced, the current intermodal transport market and available intermodal statistics have been analysed in order to see whether a forecast for intermodal transport within and in relation with the CEECs can be based on the current situation. Based on this analysis it was decided not to use the available intermodal base year information in the forecasting process.

Since the information about the current intermodal transport flows within and in relation with the CEECs are no good base for making a forecast of the future intermodal transport flows, an approach is applied that determines the potential future intermodal transport flows based on characteristics of the total future transport demand. The base year information of the total transport demand forms a good base for making forecasts because data is used from the NEAC information system in combination with data collected in the INTERMODA project, these data provide a reliable description of the total transport demand in the base year. Therefore, at first a forecast of the total transport demand has been made followed by a forecast of the intermodal transport demand. A number of criteria like transport distance, transport volume, commodity types and intermodal market shares are applied on the total future transport flows. The flows fulfilling the different thresholds of the criteria are being indicated as future potential intermodal transport. For flows that do not fulfil the thresholds of the criteria, intermodal transport is not competitive, while for flows that do fulfil the thresholds of the criteria, intermodal transport is competitive.

The overview of the future potential intermodal transport demand is a good indication of where developments of intermodal transport can be expected in the future. However, the fact that intermodal transport is competitive for specific flows does not necessarily mean that market actors actually start using intermodal transport alternatives. Due to for instance lack of knowledge or organisational problems the market actors might not want to use intermodal transport. In this respect, the future potential intermodal transport can be regarded as a favourable estimate of the future intermodal transport. In order to check the reliability of the method, the method has been applied on the Western European situation and the results have been compared with available statistics for Western Europe. The conclusion of this exercise

was that the method produces results for the Western European situation that are – on an aggregate level – close to the ‘actual situation’ described in statistics.

The dimensions of the actual intermodal transport demand in 2015 depend not only on technical conditions related to transport flows but also to a large extent on the decisions taken by actors in the market, local governments, EU policy and the interaction between them.

Aggregate figures for the potential intermodal transport are the following. Continental transport concerns 30 million tonnes in the reference scenario and 42 million tonnes in the alternative scenario. Maritime intermodal transport concerns 36 million tonnes in the reference scenario and 45 million tonnes in the alternative scenario.

The reference scenario results show where intermodal transport flows can be expected in the future. Since there are many future situations possible, the alternative scenario results show where the intermodal transport flows can be expected in a more ‘optimistic’ intermodal scenario in order to obtain a broader view of the range of possible outcomes.

The results of the reference scenario show that there are a limited number of relations that have potential for intermodal transport in 2015. The elimination of bottlenecks and the promotion of intermodal transport should mainly focus on these specific relations since the chances to achieve a shift to intermodal transport are highest on these relations.

From the comparison between the results of the reference scenario and the alternative scenario it can be concluded that the future potential intermodal transport in 2015 will be higher in a ‘more optimistic’ scenario, but that the increase of the potential intermodal transport largely occurs on the same relations and in the same regions that have already high potential intermodal transport flows in the reference scenario. This result confirms the conclusion that the potential intermodal transport flows are limited to a specific number of relations and regions and that most of the effort put in promoting intermodal transport should be addressed to these relations and regions.

REFERENCES

Literature

- Bergeijk, P.A.G. van, 1991, *Trade, politics and trade policy*, The Hague
- EUFRANET, 2000, *Final report for publication*, project funded by the European Commission under the transport RTD programme of the 4th framework programme, Brussels
- EUROSTAT, 2002, *Meeting on the working group on intermodal transport statistics, EU intermodal freight transport – key statistical data 1992-1999*, Luxembourg
- EXPEDITE, 2001, *Deliverable D3 – Summary report on reference scenario and policies*, project funded by the European Commission under the transport RTD programme of the 5th framework programme, Brussels
- INFREDAT, 1999, *Deliverable D2 – Review report on intermodal freight transport data and methodologies*, project funded by the European Commission under the transport RTD programme of the 4th framework programme, Brussels
- INFREDAT, 1999, *Deliverable D3 - Intermodal freight transport data model & database structure*, project funded by the European Commission under the transport RTD programme of the 4th framework programme, Brussels
- INFREDAT, 2000, *Deliverable D4 – Data collection approach*, project funded by the European Commission under the transport RTD programme of the 4th framework programme, Brussels
- INTERMODA, 2002, *Deliverable D1 - Identification of Requirements on Intermodal Transport*, project funded by the European Commission under the transport RTD programme of the 5th framework programme, Brussels
- INTERMODA, 2003, *Deliverable D7 – Outlining the methodology for identifying and prioritising bottlenecks and constraints, and the use of the methodology*, project funded by the European Commission under the transport RTD programme of the 5th framework programme, Brussels
- INTERMODA, 2003, *Deliverable D9 – Future Transport Demand*, project funded by the European Commission under the transport RTD programme of the 5th framework programme, Brussels
- INTERMODA, 2003, *Deliverable D10 – Intermodal future network*, project funded by the European Commission under the transport RTD programme of the 5th framework programme, Brussels
- Linneman, H., 1966, *An econometric study of trade flows*, Amsterdam
- NEA, 1997, *IQ project task 1.4*, interim report, Rijswijk
- NEA – INRETS – IWW, 1999, *Traffic forecast on the ten pan-European transport corridors of Helsinki, Final report and annexes A to E*, Rijswijk
- NEA, 1999, *European transport forecasts 2020, freight transport*, Rijswijk

- NTUA, *The PRIMES energy system model, summary description*, Athens
- TNO Inro, 1999, *Transport forecasting goods and passengers 2020, definition of scenarios 1995 – 2000 – 2010 – 2020*, Delft
- VUA, *Open windows of Europe*, Amsterdam

Data sources

- INTERMODA website: www.intermoda.org
- NEAC model and information system – NEA Transport Research and Training

  Website: www.nea.nl/neac.
- Intermodal statistics published by ICF

  Website: www.icfonline.com
- Intermodal statistics published by UIRR

  Website: www.uirr.com
- Annual seaborne transport between reporting and partner countries/MCA (main coastal area),
  New Cronos, EUROSTAT

  Website: http://www.datashop.org/en/bases/newcronos.html
- External trade in the European Union and trade between member states,
  COMEXT, EUROSTAT

  Website: www.datashop.org/en/bases/comext.html